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IN THE INTERNATIONAL BUREAU (WIPO)

International Application Number	International Filing Date	International Earliest Priority Date
PCT/US04/21468	1 July 2004	17 October 2003

Title of Invention: **Compositions, Configurations, And Methods Of Reducing Naphthenic Acid Corrosivity**

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**LETTER FOR PCT ARTICLE 19  
(PCT SECTION 205)**

1. Applicant herewith submits replacement sheets numbered **18-22** to replace sheets numbered **18-22** originally filed for this application.

2. In respect of each claim appearing in the international application based on the replacement sheets submitted herewith, and in accordance with PCT Section 205, the following claim(s) is/are:

- (i) unchanged: claim(s) **1-9, 11-12, 14-15, and 17-33**
- (ii) cancelled: claim(s) **-/-**
- (iii) new: claim(s) **-/-**
- (iv) replacement of one or more claims as filed, as follows: **10, 13, and 16**
- (v) the result of the division of one or more claims as filed, as follows: **-/-**

Dear Sir:

The Search Report dated December 29, 2004 designated two references as being relevant to patentability. In response, claims 10, 13, and 16 have been revised.. The revised claims and references are addressed below *seriatim*.

**Revised Claims**

10. (Amended) A plant comprising:  
a first feedstock supply providing a first feedstock, and a second feedstock supply  
providing a second feedstock;  
at least one of a crude unit and a vacuum unit, each are configured to receive the first  
feedstock and the second feedstock; and  
an instruction associated with at least one of the first and second feedstock supplies  
that provides information that wherein the second feedstock is to be fed to the  
at least one of the crude unit and the vacuum unit in a predetermined amount  
that is effective to reduce naphthenic acid corrosion in the at least one of the  
crude unit and the vacuum unit as compared to naphthenic acid corrosion of  
the first feedstock without the second feedstock.
13. (Amended) A plant comprising:  
at least one of a crude unit and a vacuum unit receiving a feedstock;  
a separation unit that removes beta naphthenic acids from the feedstock; and  
a recycling circuit fluidly coupled to the separation unit and the at least one of the  
crude unit and the separation unit, wherein the recycling circuit that provides  
at least some of the beta naphthenic acids to the feedstock.
16. (Amended) A plant comprising:  
at least one of a crude unit and a vacuum unit receiving a treated feedstock; and  
a hydrothermal treatment unit that receives a feedstock and removes at least a portion  
of alpha naphthenic acids from the feedstock to form the treated feedstock;  
and  
an instruction that provides information that the alpha naphthenic acids are to be  
removed to achieve having a predetermined alpha naphthenic acid to beta  
naphthenic acid ratio.

Petersen et al. (U.S. Pat. No. 5,182,013) in view of Danzig (U.S. Pat. No. 4,634,519)

The Office considers claims 10-17 as being obvious over Petersen et al in view of Danzig. The applicant respectfully disagrees, especially in view of the amendments made herein.

With respect to claim 1 it is pointed out that amended claim 1 expressly requires "...an instruction...that provides information that the second feedstock is to be fed to the at least one of the crude unit and the vacuum unit in a predetermined amount that is effective to reduce naphthenic acid corrosion...".

In contrast, Petersen teaches use of polysulfides that are added to reduce naphthenic acid corrosivity (NAC). Thus, the only *instruction Petersen provides is addition of a non-feedstock item to reduce NAC. Clearly addition of one feedstock with naphthenic acids to another feedstock containing further naphthenic acid is inconsistent with the claimed subject matter.* If anything, the TAN number will increase by adding a second feedstock, which is traditionally thought to be associated with an increase in NAC. Therefore, Petersen teaches away from the subject matter as presently claimed.

Danzig also fails to provide instructions to combine two feedstocks with naphthenic acids to reduce NAC. Indeed, the only thing Danzig teaches is removal of naphthenic acids using a solvent. Therefore, neither Petersen nor Danzig, alone or in combination provide any teaching, suggestion, or motivation to a plant as defined in amended claim 10. Consequently, claims 10-12 are not obvious over the cited references.

With respect to claim 13 it is pointed out that amended claim 13 expressly requires "...a recycling circuit fluidly coupled to the separation unit and the at least one of the crude unit and the separation unit [that] provides at least some of the beta naphthenic acids to the feedstock...".

Again, Petersen teaches use of polysulfides that are added to reduce naphthenic acid corrosivity (NAC), wherein the polysulfides can be recycled. Similarly, Danzig teaches that the solvent (which is used for naphthenic acid extraction) can be recycled. However, it should be noted that *recycling of NAC inhibitors or naphthenic acid specific solvents is contrary to recycling of naphthenic acids themselves.* Therefore, neither Petersen nor Danzig, alone or

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in combination provide any teaching, suggestion, or motivation to a plant as defined in amended claim 13. Consequently, claims 13-15 are not obvious over the cited references.

With respect to claim 16 it is pointed out that amended claim 16 expressly requires "...an instruction that provides information that the alpha naphthenic acids are to be removed to achieve a predetermined alpha naphthenic acid to beta naphthenic acid ratio...".

Petersen teaches inhibition of NAC by addition of a polysulfides. Therefore, the *ratio of alpha to beta naphthenic acids remains unchanged, which is entirely inconsistent with the presently pending claims.* On the other hand, *Danzig teaches general removal of naphthenic acids from petroleum distillates to obtain an essentially acid free petroleum product, which is again contrary to the claimed subject matter.* Among other things, the NAP ratio of an acid free medium will require a division by zero, which is mathematically undefined. Therefore, neither Petersen nor Danzig, alone or in combination provide any teaching, suggestion, or motivation to a plant as defined in amended claim 16. Consequently, claims 16-17 are not obvious over the cited references.

In view of the present amendments and arguments, the applicant believes that all claims are now in condition for allowance. Therefore, the applicant respectfully requests that a positive IPRP be issued in this case.

Respectfully submitted,



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